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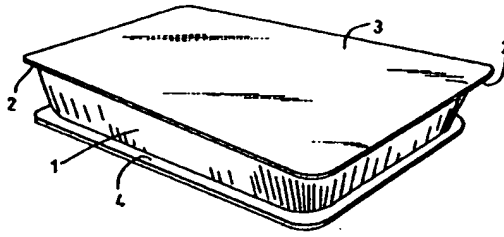
CONTAINER COMPRISING A THERMOFORMED SHEET
AND A REINFORCEMENT PLATE

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The invention concerns a container of the type comprising a sheet made of thermoformed synthetic material to constitute at least one compartment having a bottom, lateral walls, and a peripheral upper edge.

It is characterized in that this sheet (1-20) is connected to a reinforcement sheet (4) located under the bottom.

According to a special embodiment variant, the thermoformed sheet receives a lid (3) fixed to the edge (2-21) located on the periphery of the sheet (1-20). One then obtains a complete assembly, which can be handled, stored, and sold without other supplements.



Numerous containers exist which comprise a part made of cardboard (or a similar material) and a part made of a synthetic material.

A classic container thus comprises a sheet made of synthetic material, which is generally transparent, to ensure the essential sealing function, and an outer wrapping made of printed cardboard to ensure the essential function of presentation.

The reality is much more complex because of the extreme diversity of problems posed because the containers are very different from each other depending on the volume which they are intended to contain. Indeed, it is clear that the same container cannot be used to contain eggs, candy, or prepared dishes.

Consequently, depending on the applications, the containers have very different structures.

However, a universal constraint exists which is the result of the three dimensions of space, as soon as the idea is to "wrap" a volume, the container itself must be a volume, and thus, in general, it has a bottom, a cover parallel to the bottom, and lateral walls.

The simplest and most widespread volume is that of parallelepipedal: two large faces (bottom and lid) and four lateral faces.

Because of its suitability for properly receiving print, the cardboard is visible from the outside, either because it forms the external faces of the container, or because it is visible through a transparent film wrapping.

When the products are sold in stores, the containers are designed in such a manner that the buyers are quickly and well informed, and one takes care to use attractive print, which is visible on the faces of the containers intended to be displayed. In general, containers rest on their bottom, "upright," with at least one of the lateral faces (called "front face") carrying the essential information in printed form: product name, brand name, use, composition, slogan, etc.

The present invention offers a novel solution which makes it possible to make containers of various complexity, from the most economic to the most luxurious, with special attention to the rigidity of the part made of synthetic material, which allows the use of novel packaging and presentation methods, where the main print is on at least one of the large faces (cover, lid).

For this purpose, the invention relates to a container of the type comprising a sheet made of thermoformed synthetic material to constitute at least one compartment having a bottom, lateral walls and a peripheral upper edge, characterized in that this sheet is integrally connected to a reinforcement sheet located on the bottom.

According to other characteristics of the invention:

- the thermoformed sheet receives a lid which is fixed to the edge located on the periphery of the sheet;
- the perimeter of the reinforcement sheet is smaller than that of the edge located on the periphery of the thermoformed sheet;
- the perimeter of the reinforcement sheet is substantially equal to that of the edge located on the periphery of the thermoformed sheet;
- the sheet is transparent and it reveals its content, between the reinforcement plate and the lid, where both are opaque and/or printed on;
- the container is combined with an external wrapping;
- the wrapping consists of a sheath, particularly made of cardboard;
- the wrapping consists of a box, particularly made of cardboard;
- the wrapping is fixed, particularly by gluing, to the reinforcement plate;
- the box comprises, on the one hand, a body consisting of an upper reinforced loop surrounding an opening, lateral walls integrally connected to the reinforced loop, fixation flaps integrally connected to the lateral walls, and on the other hand, a lid which is articulated at one of the margins of the reinforced loop and which must be folded back on the body after the container has been introduced through the opening until the reinforcement plate is located at the level of the fixation flaps which are folded perpendicularly with respect to the lateral walls, where these fixation flaps must be connected, particularly by gluing, to said reinforcement plate;
- the opening is obtained by cutting a blank of cardboard, where the central part which is removed to create the opening is recovered to constitute the reinforcement plate;
- the perimeter of the reinforcement plate being smaller than that of the edge located on the periphery of the thermoformed sheet, where this edge rests on the reinforced loop surrounding the opening of the box.

The invention will be better understood following the detailed description given below with reference to the drawing in the appendix. Naturally, the description and the drawing are only provided for information as a nonlimiting example.

Figure 1 is a schematic view of a container according to the invention, according to a first simple and inexpensive embodiment variant.

Figures 2 and 3 are two partial schematic views showing in cross section two variants of the operation of sealing a lid to a container according to the invention.

Figure 4 is a schematic vertical section of a container according to the invention, whose lid is sealed according to the method illustrated in Figure 3.

Figure 5 is a partial schematic view of the same container as in Figure 4, but placed on its side, and no longer in vertical section.

Figure 6 is a schematic vertical section of a container according to the invention, whose lid is sealed according to the method illustrated in Figure 2.

Figure 7 is a schematic front view of a container of the type in Figure 6, in combination with an external sheath, for example, made of cardboard.

Figure 8 is a schematic perspective view of a container of the type in Figure 5, in combination with an external envelope consisting of a sheath made of synthetic material, and closed at the ends by transverse seams.

Figure 9 is a plan view of a blank of cardboard cut and grooved to constitute, after folding and gluing, a box which is to receive a content of the type of Figures 2 and 6 to form together a complete packaging whose quality and complexity are adapted to the packaging of high-quality and/or particularly delicate products.

Figure 10 is a schematic perspective view illustrating the preparation of a container intended to be used in combination with the box of Figure 9, and whose reinforcement plate is recovered from the blank during its cutting.

Figure 11 is a schematic perspective view of a box originating from the blank of Figure 9 and during the assembly, above which the container of Figure 10 which is to be used in combination with the box has been represented.

Figure 12 is a schematic cross-sectional view of the complete packaging of Figure 11 after filling, closing with a lid, fixation in the box, and closing of the box by an attached lid.

With reference to Figure 1, one can see a container according to the invention which presents a body 1 having a continuous peripheral edge 2 and constituting a single compartment made by thermoforming a film made of synthetic material, as is known in itself.

This part is formed from an expensive material and, for reasons of cost price, it must be given a minimal thickness, also for technical reasons, because the thicker the film, the more time and energy consuming the thermoforming is.

By itself, the body 1 forms a tray which is sealed and capable of receiving any content, for example, food products: preprepared products, biscuits, baked goods, etc., or any other object.

After filling the tray 1, one applies a lid 3 here consisting of a synthetic material which is compatible with that which forms the body 1 and its edge 2, to be able to fix it by welding to the edge 2.

Unfortunately, the technical and economic constraints are such that the tray 1-2 (and the lid 3, if any) has a very low rigidity, which makes it unsuitable for individual use.

Until now, such a structure has not existed other than in combination with a rigid external wrapping, such as a box made of cardboard.

According to the invention, the bottom of the tray 1 is integrally connected to a rigid reinforcing plate 4, for example, made of cardboard, whose perimeter is coordinated with that of the edge 2, as will be explained below.

In addition, for given products, the thermoformed film employed for using the invention can be more refined, and thus more expensive, because its integral connection to the rigid plate 4 confers excellent mechanical resistance to it.

It then becomes possible to handle the tray 1 and its plate 4, because the packaging machines are well adapted to the different actions that need to be performed on the assembly 1-4: taking off, lifting, setting, removal, transport, etc.

Thus, one can fill the tray 1 and the lid to constitute a finished packaging or combine it later with a supplement: sheath, envelope, box or other.

When the product allows it, one can consider the filled tray 1, closed by the lid 3 and integrally connected to the plate 4 forming an entity which is ready for storage, transport or distribution.

Its low price makes it competitive with inexpensive mass market products.

Naturally, the lid 3 can present all sorts of decorations, texts, drawings. With regard to the plate 4, the fact that it is advantageously made of cardboard also allows it to receive print.

The perimeter of the plate 4 is of importance with respect to that of the edge 2.

Indeed, to seal the lid 3 to the edge 2, sufficient pressure and heating must be simultaneously applied, and to achieve this, an electrode is used which is lowered on the lid 3 perpendicular to the edge 2, the latter being supported by a counterpart which is also movable and has been brought under the edge 2.

With reference to Figure 2, one can see a classic method which consists in mounting an electrode 10 and its counterpart 11 on vertical lifts, where the electrode 10 can be moved downward and upward along the arrow F1, while the counterpart 11 can be moved upward and downward along the arrow F2. The edge 2 and the lid 3 are, in a manner of speaking, gripped between the electrode 10 and its counterpart 11 when these parts are brought close to each other, as shown in the drawing.

This method is only applicable if the plate 4 is sufficiently small to provide space for the counterpart 11 on the four sides of the assembly. In other words, the perimeter of the plate 4 must be less than that of the edge 2.

However, this solution presents the drawback of making it practically impossible to place the container on one of its sides because the sharp part of the edge 2 and the sharp part of the corresponding plate 4 are not vertical with respect to each other.

It is possible to give preference to the reverse solution which is illustrated in Figures 3, 4 and 5, and which provides for the edge 2 and the plate 4 to have the same perimeter. In that case, it becomes possible to place the containers edgewise, as represented in Figure 5, and this can be of great importance because one can present the containers in the upright position, placed on shelves in a store, with the large face of the lid 3 being vertical and clearly displayed for the buyers.

Figure 4 shows that when the container is put in the flat position, the horizontal dimensions are exactly the same as that of a classic box which would have the circumference of the edge 2 and the plate 4. Thus one can see that if one uses a transparent film to constitute the tray 1, buyers can observe the content without opening the container. In this case, biscuits A are used, arranged obliquely with respect to each other, and drawn in thin lines to better show the interposition of the tray 1 between them and the observer's eye.

Naturally, the advantage of being able to observe the products through the small sides of the container exists, regardless of the relation between the perimeters of the edge 2 and of the plate 4.

The sealing of the lid 3 is less simple, because the plate 4 no longer allows the vertical passage from bottom to top of the counterpart 11.

In Figure 3, one can see that one solution consists in using a counterpart 12 having an upper part 13 analogous to that of the counterpart 11 and an oblique bottom part 14 where a pivot 15 allows the entire counterpart 12 to pass from an active position (represented in solid lines) to a retracted position (represented in dotted lines) and vice versa, along the arrow F3.

The counterpart 12 can thus be put in place and retracted regardless of the presence of the plate 4 perpendicular with respect to the edge 2.

The control means of the electrode 10, of the counterpart 11 and of the counterpart 12 are of any known type available to a person skilled in the art, and therefore they will not be described in detail.

The container of Figures 1-5 is simple, because the tray 1 represents a single compartment, but it is possible to apply the invention to a compartmentalized tray which thus presents two or three bottoms.

Similarly, the invention applies to honeycombed plates, that is plates presenting a plurality of housings and bottoms, as is the case for the packaging of delicate products, such as baked goods made of chocolate, because it is necessary to place each piece in a particular cell.

In this case, the plate 4 can be connected to each cell bottom or to only some of them, depending on the circumstances.

When the tray comprises a single bottom or bottoms having a large surface, the plate 4 can be fixed over its entire surface, by areas or by points.

Figure 6 represents a container consisting of a honeycomb plate 20 having a single peripheral edge 21 and a plurality of cells 22.

After thermoforming, the plate 20 receives a plate 4 (for example, glued to each cell bottom 22); then, the products are placed in the cells 22 and finally, the lid 3 is fixed to the edge 21.

Depending on the characteristics of the products and/or intended markets, one may wish to improve the packaging by combining the already described container with a more or less complex and luxurious wrapping.

In Figure 7, a container of the type in Figure 2 is shown, which is formed of a single tray 1 whose edge 2 has a larger perimeter than that of the plate.

After filling and closing with a lid of the tray 1, the assembly is surrounded by a blank of cardboard which is printed on and grooved to present a large face 30 above the lid 3, two sloped lateral faces 31 and 32, a lower panel 33 and a closing face 34 fixed to the panel 33. In this arrangement, this section constitutes a sheath which is open at its two ends.

To prevent longitudinal sliding of the content 1-2-3-4 in the sheath which surrounds it, one can provide a blocking means such as a point of glue on the lid 3 and/or under the plate 4.

In Figure 8, a container of the type in Figure 2 is shown, which is formed of a single tray 1 whose edge 2 has a perimeter which is larger than that of the plate.

After filling and closing the tray 1 with a lid, the assembly is placed in a sheath made of synthetic material 40, for example, one that is transparent, which is closed by transverse welding in the vicinity of the ends, which leaves two margins 41 and 42, as is known in itself.

This ensures more protection, particularly against humidity, which may be desirable if the plate 4 and/or the upper face of the lid 3 are made of humidity-sensitive cardboard and the conditions of storage or transport involve a very humid environment, rain or other exposure to weathering.

Naturally, as is well known, one can also apply a vacuum between the container proper and the sheath 40.

With reference to Figures 9 and 10, one can see a more elaborate packaging example, since it comprises a container of the type in Figures 1-6 in combination with an enclosure which is practically as complete as a box. However, owing to the invention, one obtains a high-quality presentation with more practical means than those known to a person skilled in the art.

In a first phase, one creates a blank of grooved cardboard, cut as indicated in Figure 9 so as to present a frame 50 which surrounds an opening 51 and which is marked by grooved lines 52, 53, 54 and 55, beyond which a cover 56 and three walls 57, 58 and 59 are located. Grooved lines 60, 61, 62 and 63 give rise to gluing tabs 64, 65, 66 and 67 on the two small sides of the walls 57 and 59.

The three walls 57, 58 and 59 present grooved lines 68, 69 and 70 beyond which flaps 71, 72 and 73 are located, whose function will be described below.

Indeed, the cover 56 presents two parts 56 and 75 which are separated by grooved lines 76. The part 75 presents two parallel grooved lines 77 and 78 which define a wall 79 and a flap 80.

Before describing the assembly of a box from the blank of Figure 9, it should be said that the cutting of the opening 51 creates a panel which one recovers and which constitutes the reinforcement plate 4 of the container, as represented in Figure 10.

To obtain the complete packaging, one thus starts by creating the blank of Figure 9, and then one combines the honeycombed plate 20 with the plate 4 originating from the cutting of the opening 51; then, one fills the honeycombed plate 20, and one seals it by means of the lid 3, and one combines it with the box assembled as follows:

One folds the gluing tabs 64, 65, 66 and 67 along the grooved lines 60, 61, 62 and 63. One folds the walls 57, 58 and 59 along the lines 53, 54 and 55 as well as the flaps 71, 72 and 73 along the lines 68, 69 and 70.

One folds the part 75 of the lid along the line 76 so that it is applied against the part 56 to double it. One folds the wall 79 along the line 77 and the flap 80 along the line 78.

Thus one obtains a box which is represented in Figure 11, where the flaps 71, 72, 73 and 80 are not yet completely folded at right angles with respect to the walls 57, 58, 59 and 79, with which they are integrally connected.

The walls 57, 58, 59 and 79 are affixed to each other by gluing of the tabs 64, 65, 66 and 67 and they constitute, with the frame 50, a box body with a platform and lacking a bottom.

One introduces the container of Figure 10 through the opening 51, in a slightly slanted movement, which is possible since the plate 4 is formed from the part of cardboard which was removed to create this opening 51 and thus has the same dimensions as it.

In Figure 12, one can see that the length L is the length of the opening 51 and that of the plate 4.

In contrast, since the edge 21 has a larger perimeter, it cannot penetrate and it abuts against the four edges of the frame 5.

One folds back the flaps 71, 72, 73 and 80 against the bottom of the plate 4 and one attaches them to it, particularly by gluing, so that the container interior with respect to the box

forms with the latter an assembly which cannot be taken apart because the plate 4, in a manner of speaking, forms the bottom of the assembly.

The cover 56-75 is then folded back and the packaging is practically finished. In general, for sale, a packaging of this type is wrapped in a transparent sheet (not shown) which keeps the cover 56-75 closed.

To gain access to the products contained by the honeycombed plate 20, one removes any transparent sheet, one lifts the cover 56-75, [and] one withdraws the lid 3 which is readily separated from the margin 21 to which it is fixed, thus exposing the products.

It should be noted that the packaging of the products in a honeycombed plate (or tray) closed by a lid makes it possible to use the well-known atmosphere control techniques, including a vacuum, which provides a guarantee of good protection and good preservation, which is impossible with the boxes made of cardboard of the type described with reference to Figures 9, 11 and 12. The invention thus makes it possible to combine the economic and technical advantages of these packages and the aesthetic advantages of the boxes.

The obtention of a rigid container which can be manipulated independently of the box constitutes a great improvement because it allows the mechanization and automation of the filling and the closing with the lid. Currently, in contrast, one cannot proceed to fill a honeycombed plate outside a box because it has no mechanical resistance. In addition, it is not possible to place a lid, and traditionally the products are isolated from the cover 56-75 by means of an independent panel.

The person skilled in the art knows how to choose the best method of assembly: either one proceeds to assembling the box "around" the filled and closed-lid container (gluing of the tabs 64 to 67), or as indicated above, one preassembles the box and the finishing is carried out by gluing the tabs 71, 72, 73 and 80 under the plate 4.

Clearly, the container proper can be combined with an element other than the described and represented box: a box of another type, a display case, etc.

Naturally, the parts made of cardboard, such as the lid, can receive print of any type.

Claims

1. Container of the type comprising a sheet made of thermoformed synthetic material to constitute at least one compartment having a bottom, lateral walls and the peripheral upper edge, characterized in that this sheet (1-20) is integrally connected to a reinforcement plate (4) located on the bottom.

2. Container according to Claim 1, characterized in that the thermoformed sheet receives a lid (3) fixed to the edge (2-21) located on the periphery of the sheet (1-20).

3. Container according to Claim 1, characterized in that the perimeter of the reinforcement plate (4) is smaller than that of the edge (2-21) located on the periphery of the thermoformed sheet (1-20).

4. Container according to Claim 1, characterized in that the perimeter of the reinforcement sheet (4) is substantially equal to that of the edge (2) located on the periphery of the thermoformed sheet (1).

5. Container according to Claim 1, characterized in that the sheet (1-20) is transparent and it allows one to see its content (A) between the reinforcement plate (4) and the lid (3), which both are opaque and/or printed over.

6. Container according to Claim 1, characterized in that it is associated with an external envelope (30-40-50 to 80).

7. Container according to Claim 6, characterized in that the wrapping consists of a sheath (30), particularly made of cardboard.

8. Container according to Claim 6, characterized in that the wrapping consists of a box (50 to 80), particularly made of cardboard.

9. Container according to Claim 6, characterized in that the wrapping (30-40-50 to 80) is fixed, particularly by gluing, to the reinforcement sheet (4).

10. Container according to Claim 8, characterized in that the box comprises, on the one hand, a body consisting of a top platform (50) surrounding an opening (51), lateral walls (57-59) integrally connected to the platform (50), fixation flaps (71-73), integrally connected to the lateral walls (57 to 59), and, on the other hand, a cover (56-75), articulated at one of the margins of the platform (50), and intended to be folded back onto the body after the container (3-4-20) has been introduced through the opening (51) until the reinforcement plate (4) is located at the level of the fixation flaps (71-73) which are perpendicularly folded at the lateral walls (57-59), where these fixation flaps (71-73) must be attached, particularly by gluing, to said reinforcement plate (4).

11. Container according to Claim 10, characterized in that the opening (51) is obtained by cutting a blank of cardboard, where the central part, removed to create the opening (51), is recovered to form the reinforcement plate (4).

12. Container according to Claim 10, characterized in that the perimeter of the reinforcement plate (4) is smaller than that of the edge (21) located on the periphery of the thermoformed sheet (20), and this edge (21) rests on the reinforced loop (50) surrounding the opening (51) of the box.

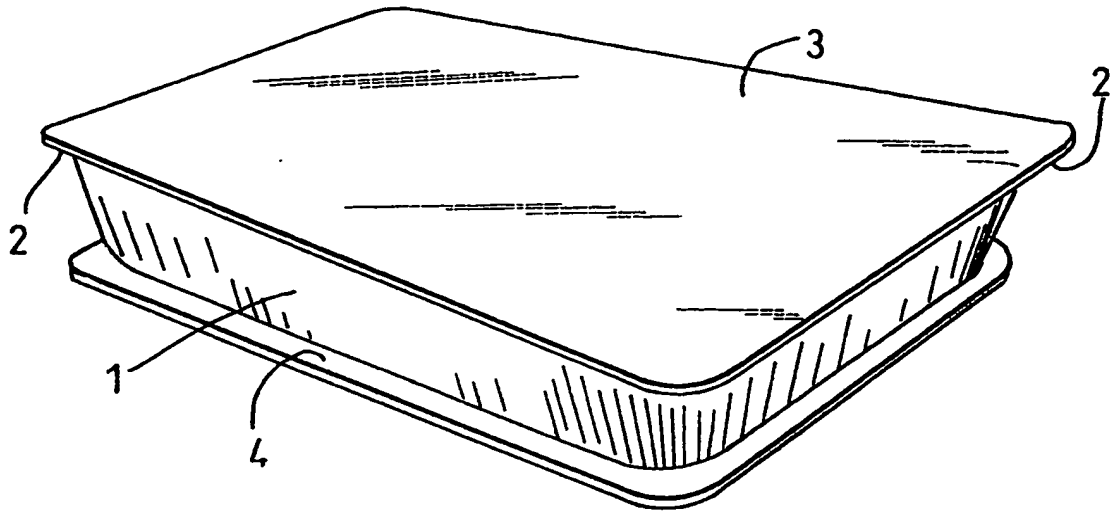


Figure 1

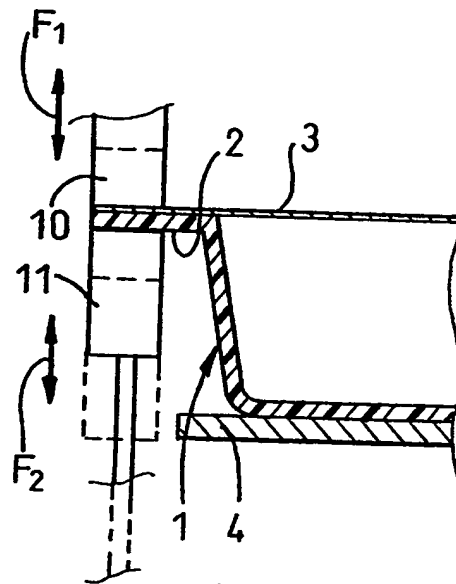


Figure 2

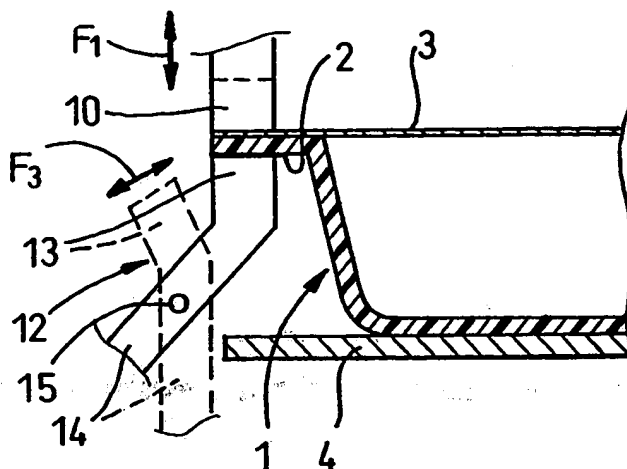


Figure 3

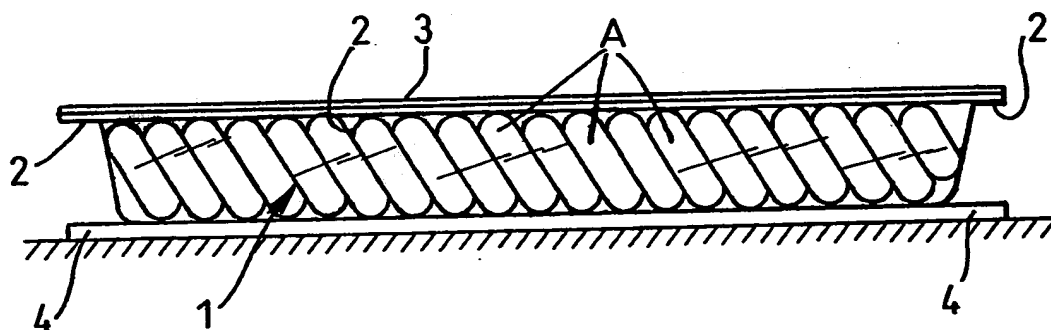


Figure 4

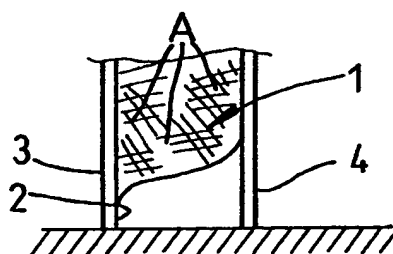


Figure 5

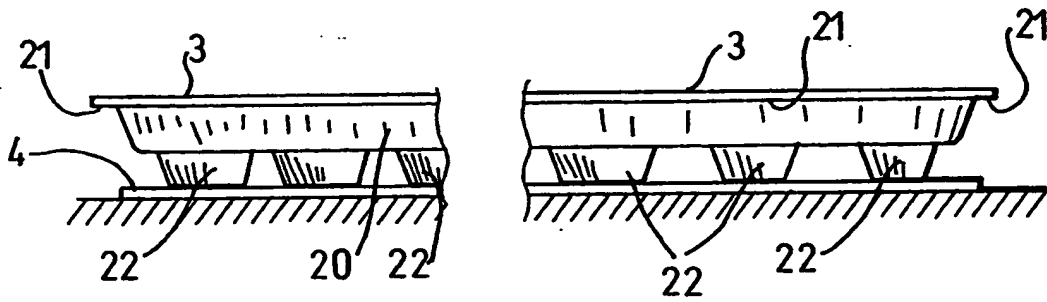


Figure 6

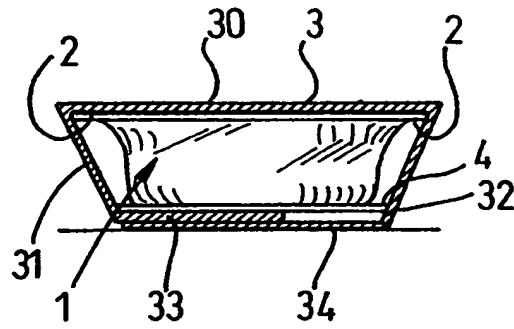


Figure 7

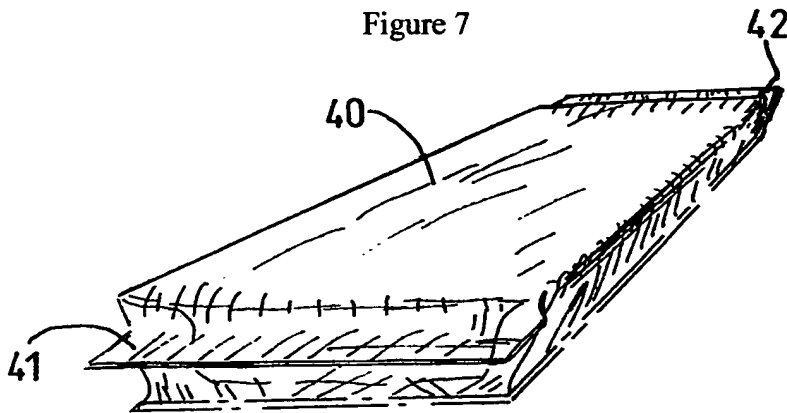


Figure 8

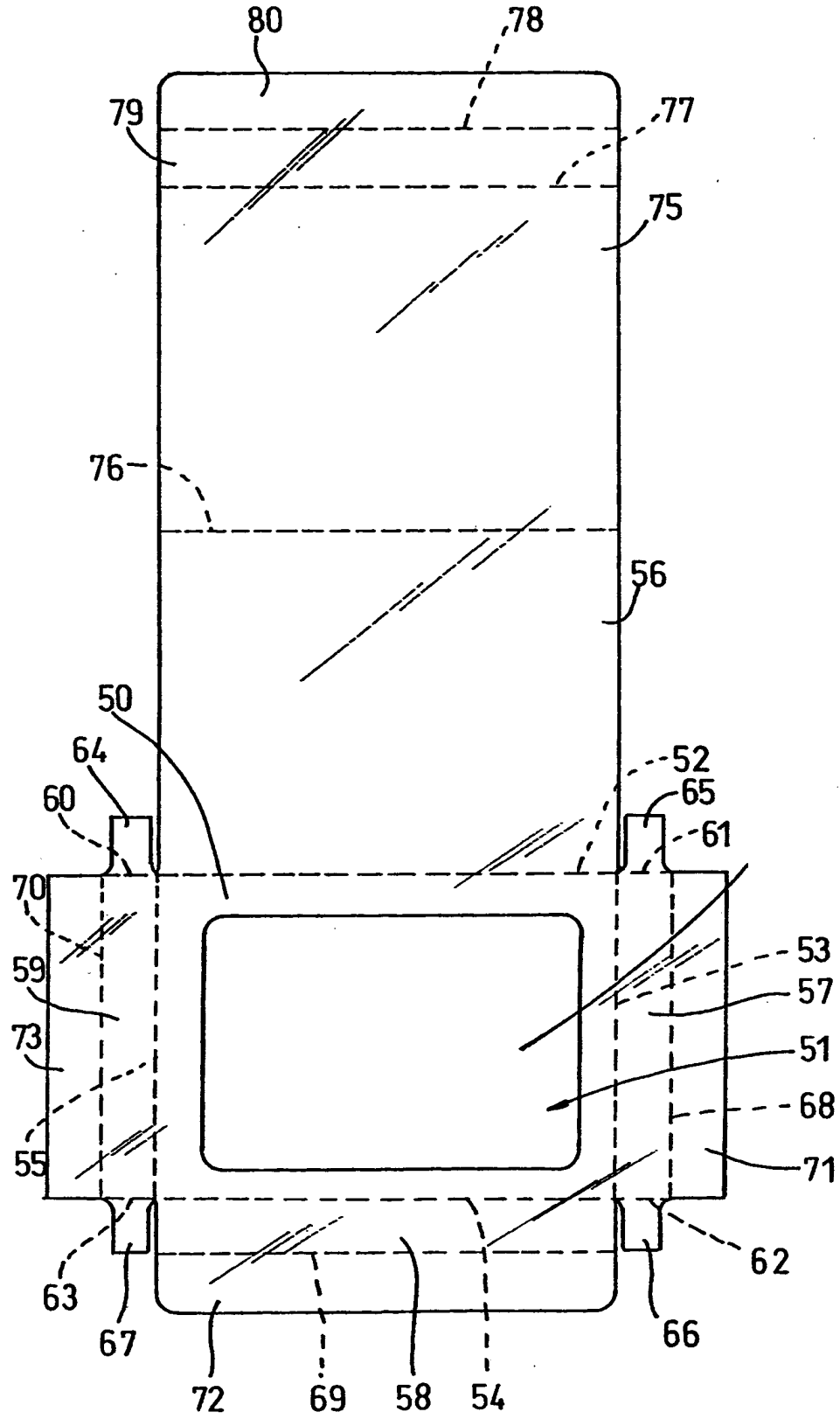


Figure 9

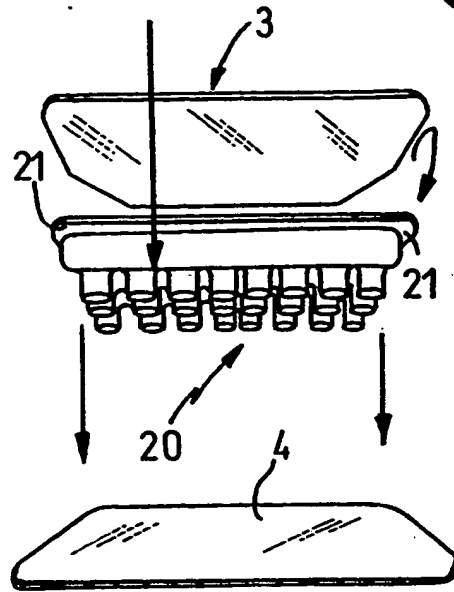


Figure 10

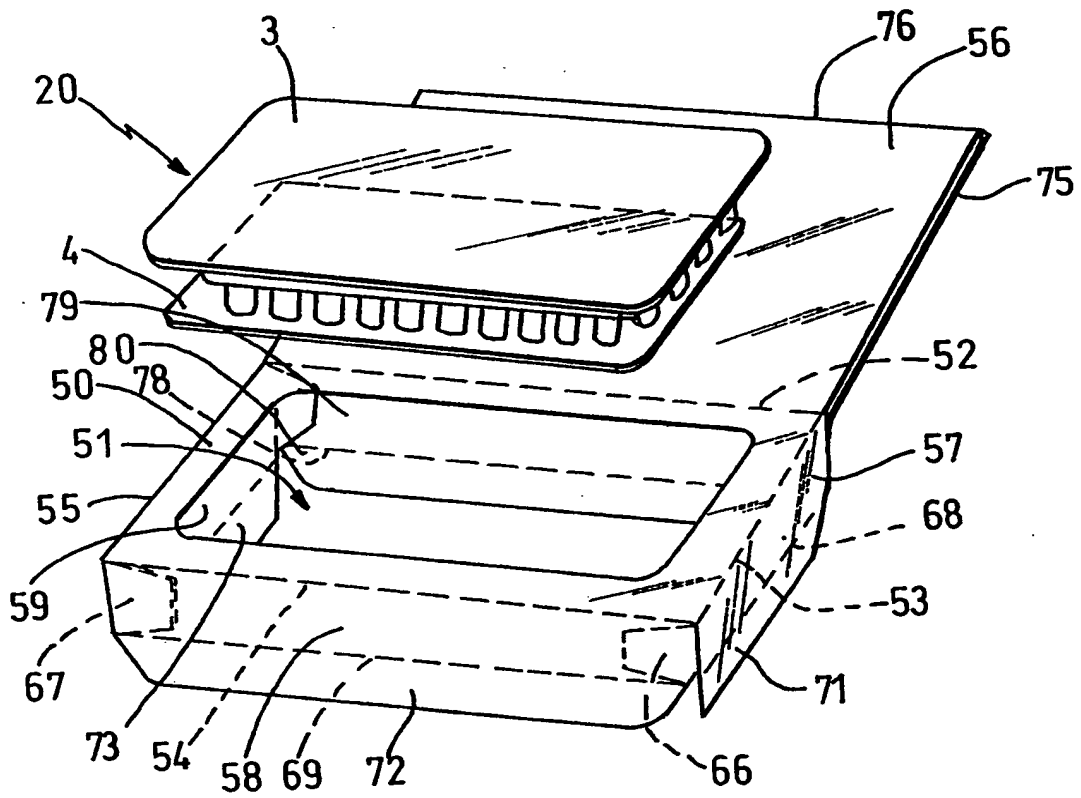


Figure 11

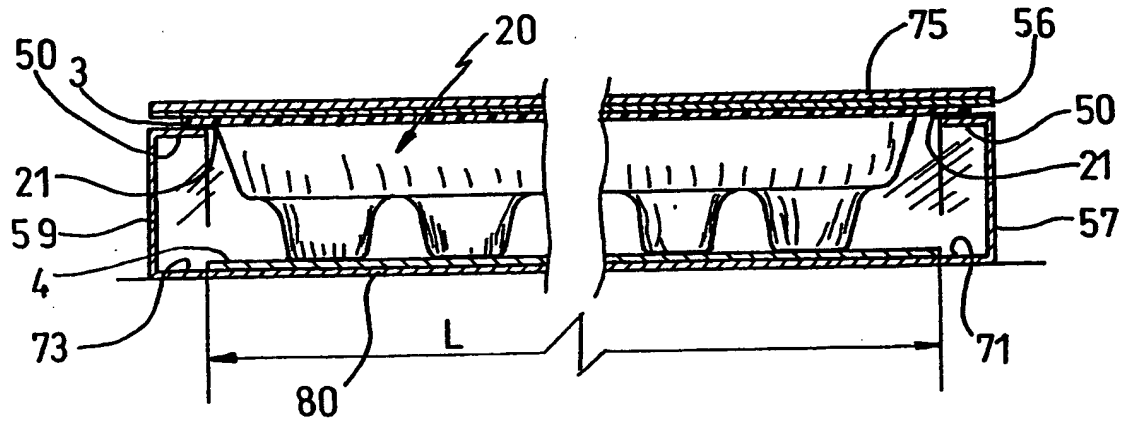


Figure 12

FRENCH REPUBLIC
National Institute
of Industrial Property

Application No.
FR 9012207
FA 448895

SEARCH REPORT
established on the basis of the most
recent claims filed before the start
of the search

DOCUMENTS CONSIDERED TO BE RELEVANT		Claims concerned in the examined document
Category	Citation of document with indication, where appropriate, of relevant passages	
A	US-A-4257530 (FALLER) * column 1, last paragraph – column 2, paragraph 1; figures 6, 7 *	1, 2
A	US-A-2335198 (SMITH) * page 1, left column, paragraph 2 * * page 1, right column, paragraphs 1-2; figures 6, 10 *	1, 4, 6
A	GB-A-1138834 (E. S. & A. ROBINSON) * page 1, lines 10-17 * * page 1, lines 68-70; figures 2, 3, 7, 8, 10 *	1, 6, 7
A	FR-A-1478293 (ILLINOIS TOOL WORKS) * page 1, left column, lines 11-18 * * page 2, left column, lines 23-32; figure 1 *	1, 5
		TECHNICAL FIELDS SEARCHED (Int. Cl. ⁵)
		B65D
Date of completion of the search JUNE 4, 1991		Examiner SPETTEL, J.D.M.L.
CATEGORY OF CITED DOCUMENTS		
X:	Particularly relevant if taken alone.	T: Theory or principle underlying the invention.
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